

REMARKS

Amendments

Claims 1-8 are cancelled and replaced by new claims 9-16. Claims 9-16 use a language in accordance with conventional US practice. Claim 16, which replaces claim 8, is written as a method claim, not a use claim. Also, claim 9 expressly recites that the plasticizer mixture comprises a first plasticizer and one or more polyalkylene glycols, a prior implicit concept. See also, e.g., page 4, lines 8-12. Further, new claims 9-16 used the conventional Markush language “selected from ... and...” and do not use the dashes present in original claims 1-8. Finally, claims 9-16 do not recite the phrase “characterized in that.”

New claims 17 - 27 are directed to further aspects of applicants’ invention. See, e.g., page 6, line 31 - page 7, line 27 and the original claims.

Rejection Under 35 U.S.C. §101

Claim 8 is rejected under 35 USC §101 as being directed to non-statutory subject matter. New claim 16, which replaces claim 8, is a method claim. Withdrawal of the rejection under 35 USC §101 is respectfully requested.

Rejection under 35 USC §112, second paragraph

As discussed above the claims use language in accordance with conventional U.S. practice. Applicants’ have used the conventional Markush phraseology “selected from... and ...” The proper conjunction in this case is “and” like when using the phrase “group consisting of ... and ...” The conjunction “or” is used when you have a Markush group defined like “R is A, B, C or D.” See MPEP 2173.05(h) and Applicants’ claim 25. Also, the pending claims do not use dashes (-), as suggested by the Examiner. Further, the claims do not recite “characterized in that.” In review of the above remarks, withdrawal of the rejection under 35 USC §112 second paragraph, is respectfully requested.

Rejection under 35 USC §103

Claims 1-7 are rejected as allegedly being obvious in view of Klang et al. (US 5,380,597). This rejection is respectfully traversed.

US '597 discloses plasticized polyvinyl acetal resins derived from 4-hydroxybutanal. These plasticized resins are disclosed as being suitable for use as "inter-layers" for laminar structures. US '597 discloses both plasticized polyvinyl acetal resins as well as polyvinyl acetal resins that are "internally plasticized," meaning that they do not require additional plasticizer. For compositions which are not internally plasticized, US '597 describes plasticizers for use with these resins.

As discussed at column 3, lines 8-19, US '597 describes conventional aliphatic esters that have been used for plasticizing polyvinyl butyral, e.g. dihexyl adipate, dibutyl sebacate, and tetraethylene glycol diheptanoate. However, these esters are said to be unsatisfactory because the glass transition temperatures of the resultant plasticized product are higher than desired and the resultant compression-molded films exhibit a marble appearance and a greasy surface.

To overcome these disadvantages associated with aliphatic ester plasticizers, US '597 disclose using other compounds not known as plasticizers for polyvinyl acetal resins, namely C₂-C₃₀ aliphatic mono-, di-, and poly-functional alcohols, ethers, and glycol ethers. Polyoxyalkylene polyols and ethers derive therefrom can also be used as plasticizers, e.g. polypropylene glycols, polyethylene glycols and copolymers of ethylene oxides and propylene oxides. These plasticizers can be used in combination with conventional ester plasticizers. See column 3, lines 8-54.

Referring to the examples, Table 1 lists the glass transition temperatures for the plasticized compositions of examples 2-10, each of which contains a single plasticizer. These compositions contain a polyvinyl acetal resin based on 4-hydroxybutanal and a single plasticizer which is tetraethylene glycol (Examples 2 and 3), tripropylene glycol (Examples 4 and 5), dipropylene glycol (Example 6), polytetrahydrofuran diol (Examples 7 and 8), or tetraethylene glycol dimethyl ether (Examples 9 and 10). Table 1 also lists comparison Examples C₁₁ - C₁₃ which use only conventional aliphatic ester plasticizers. Except for Example 8, the compositions of comparative Examples C₁₁-C₁₃ all have higher glass transition temperatures than the compositions of Examples 2-10.

As noted above, the examples presented in Table 1 use a single plasticizer, not a mixture of plasticizing agents. On the other hand, the compositions of Examples 17 and

18, listed in Table 2, each contain a combination of two plasticizers, i.e., tetraethylene glycol (TEG) and tetraethylene glycol diheptanoate (TEG-DH), the latter is described in US '597 as a conventional aliphatic ester plasticizer for polyvinylbutyral (see column 3, lines 11-12).

In the rejection, is acknowledged that US '597 does not describe an example in which a polyoxyalkylene glycol is used as a plasticizer. However, it is asserted that it would be obvious to one of ordinary skill in the art to use a polyoxyalkylene glycol in place of the plasticizers used in the examples on grounds that the increase in molecular weight of the plasticizer will lead to a decrease in glass transition temperature.

Presumably, the rejection is suggesting that one would modify Examples 17 and 18, which each contain a mixture of plasticizers, so that the tetraethylene glycol plasticizer is replaced by an polyoxyalkylene glycol, based on the assertion that the higher molecular weight plasticizer will lead to a decrease in glass transition temperature.

In support of this theory of motivation, the rejection refers to Examples 4 and 6 of US '597. The composition of Example 4 contains 30 % weight tripropylene glycol and has a glass transition temperature of 19° C. Conversely, Example 6 contains 30 % weight dipropylene glycol and has a slightly higher glass transition temperature of 21° C i.e., only 2 degrees higher. Nothing within the rejection suggest this small degree difference in glass transition temperature would provide sufficient motivation to make the alleged modification. Nor does US'597 attribute the slightly lower glass transition temperature to the higher molecular weight of tripropylene glycol.

Moreover, other examples in US '597 show that the theory of higher molecular weight leading to lower glass transition temperature is incorrect. For example, the composition of Example 2 contains 30 % weight tetraethylene glycol and has a glass transition temperature of 11° C. Example 4, as noted above, contains 30 % weight tripropylene glycol and has a glass transition temperature of 19°C. Thus , the glass transition temperatures of these compositions differ by 8°C, yet the molecular weights of the plasticizers are approximately the same.

Furthermore, compare Examples 7 and 8 which both use polytetrahydrofuran diol as the plasticizer. In Example 7 the plasticizer has a molecular weight of 250 while in Example 8 the plasticizer has a molecular weight of 650. The composition with the higher

molecular weight plasticizer, i.e. Example 8, has a significantly higher glass transition temperature, 74°C, in comparison to the 29°C glass transition temperature for Example 7.

Compare also Examples 9 and 10 to Examples 2-6. In each of Examples 9 and 10 the plasticizer is tetraethylene glycol dimethyl ether which has a molecular weight of about 223 g/mol. This plasticizer has a higher molecular weight than any of the plasticizers used in Examples 2-6, i.e. tetraethylene glycol (approximately 194 g/mol), tripropylene glycol (192 g/mol), and dipropylene glycol (134 g/mol). Yet, the glass transition temperatures, for example, 9 and 10 are 46° C and 35°C, respectively, both of which are at least 10° higher than the glass transition temperatures for any of the compositions of Examples 2-6.

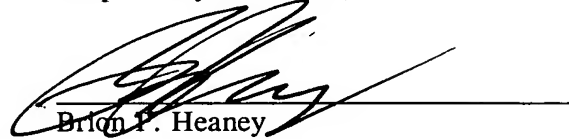
Thus, contrary to the assertion in the rejection, US '597 does not suggest that the use of a plasticizer with a higher molecular weight will lead to a decrease in glass transition temperature. In fact, as can be seen from the above analysis, many of the examples suggest that an increase in the molecular weight of the plasticizer will result in an increase in the glass transition temperature. Thus, US '597 actually teaches away from the claimed invention.

In view of the above remarks, it is respectfully submitted that Klang et al. (US '597) fails to provide sufficient motivation which would lead one of ordinary skill in the art to modify the compositions described therein in such a manner so as to arrive at an embodiment in accordance with Applicants' claimed invention. Withdrawal of the rejection under 35 USC §103 is respectfully requested.

In regards to Japanese reference No. JP 7097240 listed on the Form PTO-1449 and filed with the Information Disclosure Statement on August 12, 2002, attached herewith is an English abstract of JP 7097240 as listed on the attached Form PTO-1449. Applicants' respectfully request an initial copy of Form PTO-1449 to be returned to the undersigned attorney.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Brian P. Heaney', is written over a horizontal line.

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